



Preliminaries



Federal/Corps Planning Process

PA Program Plan Formulation
Supplement - FY 08

Objective:

This module will discuss the following:

- What is Federal water resources planning?**
- What are the six steps of the planning process (and how are plans evaluated)?**



A PLANNING MODEL

What are the problems?

How can they be solved?

What are the advantages and disadvantages of all potential solutions?

Consider different viewpoints.

What's the best solution meeting Corps criteria?

Implement the solution.

Feedback.

FEDERAL WATER RESOURCES GUIDELINES

- 1.3.2 Major Steps - steps, iteration**
- 1.4.4 Federal-State Relationship in Planning**
- 1.4.2 International Consultations**
- 1.4.3 General Public Participation**
- 1.4.4 Review and Consultation**
- 1.4.5 Interdisciplinary Planning**
- 1.4.7 Planning Area**
- 1.4.12 Period of Analysis**

**“Economic and Environmental Principles and
Guidelines for Water and Related Land
Resources Implementation Studies”**

FEDERAL FORMULATION CRITERIA

***Alternative plans...should be formulated
in consideration of four criteria:***

- (1) Completeness.**
- (2) Effectiveness.**
- (3) Efficiency.**
- (4) Acceptability**

Guidelines

Principles and

Paragraph 1.6.2(c)

CORPS PLANNING REFERENCES

ER 1105-2-100 - Chapter 2

Planning Manual - Chapters 5, 12,
13

Six Steps in Planning Process:

- ❑ **Step 1 - Problems and Opportunities**
- ❑ **Step 2 - Inventory and Forecast Resources**
- ❑ **Step 3 - Formulating Alternative Plans**
- ❑ **Step 4 - Evaluation of Alternative Plans**
- ❑ **Step 5 - Comparison of Alternative Plans**
- ❑ **Step 6 - Select Recommended Plan**

Project Planning



STEP 1: Problems and Opportunities

- ▮ **Identify the setting:**
 - ▮ **Partnership**
 - ▮ **Planning area**
 - ▮ **Period of analysis**
 - ▮ **Interdisciplinary team**
 - ▮ **Stakeholders**
 - ▮ **Public scoping meeting**
- ▮ **Specific problems**
- ▮ **Specific opportunities**
- ▮ **Specify planning, goals, objective and constraints**



STEP 2: Inventory and Forecast Resources

- ❑ **Planning requires information**
- ❑ **External and internal factors influence the study environment**
- ❑ **Determine existing conditions**
- ❑ **Forecast future conditions and establish Without Project Condition(s)!!**



STEP 3: Formulation of Alternative Plans

- ▮ **Plan formulation is using systems of measures, strategies, or programs to fully or partially meet the identified planning objectives, subject to the planning constraints.**
- ▮ **Generating “full” array of reasonable alternatives (NEPA)**
- ▮ **The Principles and Guidelines (P&G) is the standard to formulate alternative plans**
 - ▮ **Effective**
 - ▮ **Efficient**
 - ▮ **Complete**
 - ▮ **Acceptable**

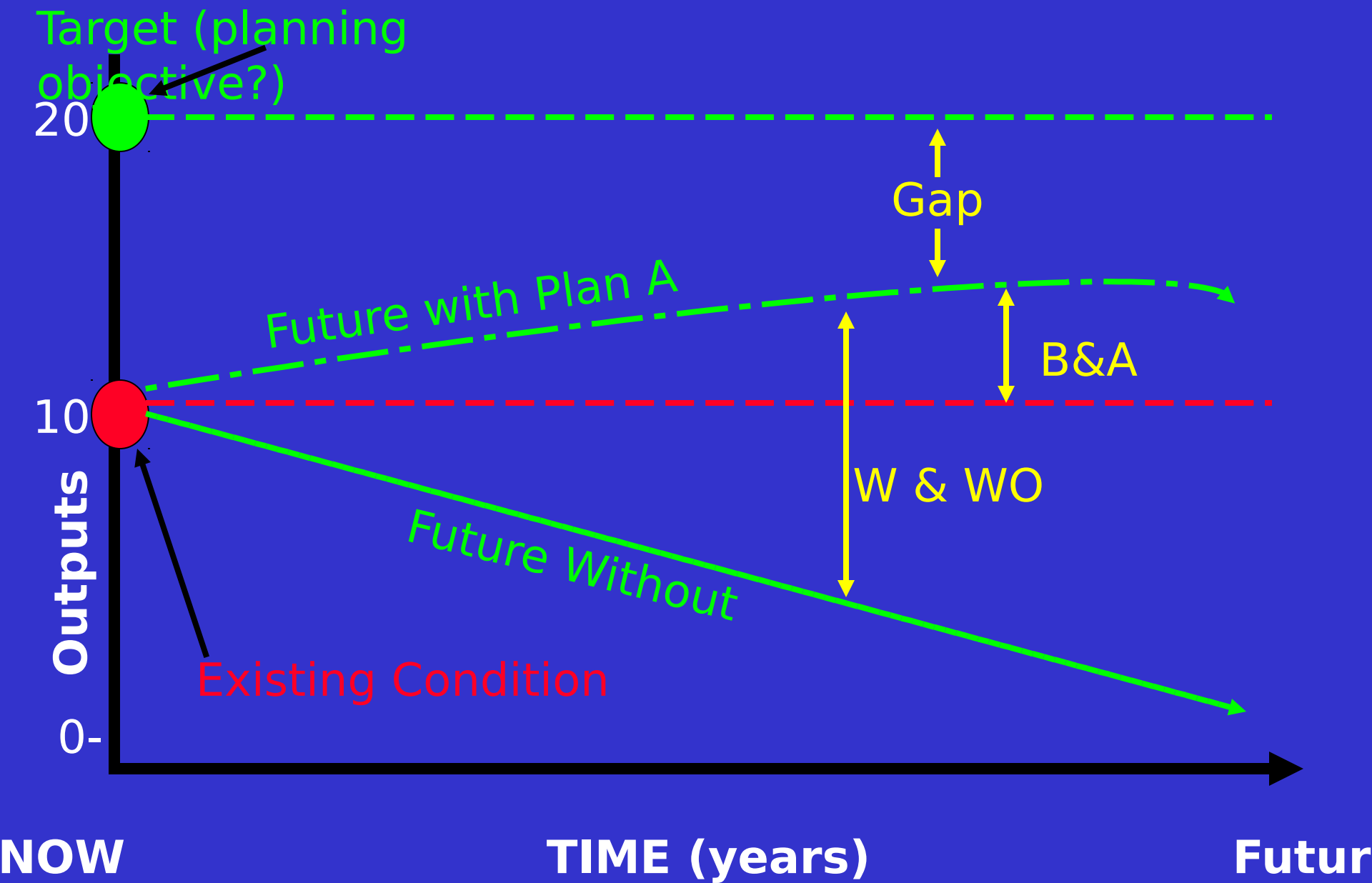
Feasibility Scoping Meeting (FSM)

- ▮ **Reference ER 1105-2-100 Appendix G, Amendment 1**
- ▮ **Mandatory meeting with the Corps Vertical Team, sponsors, agencies, and stakeholders**
- ▮ **Establish buy-in for Without Project Condition(s)**
- ▮ **Review/Update analysis yet to be done**
- ▮ **Present preliminary measures and alternatives array**

STEP 4: Evaluation of Alternative Plans

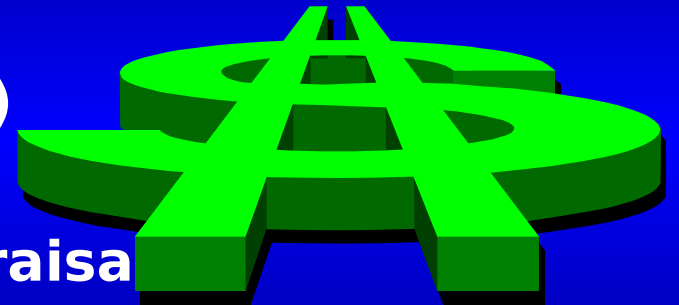
- ▮ **Compare with and without project conditions**
- ▮ **Screen alternatives**
- ▮ **Evaluate alternatives and present results of:**
 - ▮ **Costs and Mitigation Requirements**
 - ▮ **Benefits (monetary and non-monetary)**
 - ▮ **P&G Accounts Impacts**
 - ▮ **NED - National Economic Development**
 - ▮ **RED - Regional Economic Development**
 - ▮ **EQ - Environmental Quality**
 - ▮ **OSE - Other Social Effects**





PROJECT COSTS

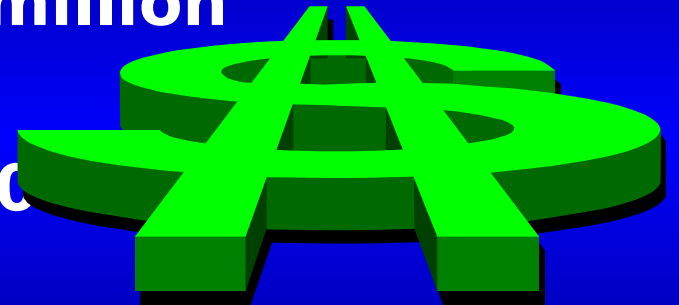
- ▮ **Preconstruction, Engineering and Design (PED) Costs**
- ▮ **Construction Costs (M-CACES)**
- ▮ **Real Estate Costs (Gross Appraisal)**
- ▮ **Operation & Maintenance Costs**



[Convert these costs to annual costs for comparison]

PROJECT COSTS

- ▮ Mobilize and Demobilize Dredge = \$900,000
- ▮ Dredge Channel = \$18.9 million
- ▮ Real Estate = \$6 million
- ▮ Plans and Specs. = \$900,000
- ▮ S&A = \$450,000
- ▮ FIRST COST TOTAL = \$27,170,000



- ▮ Annualized First Cost = \$2,218,000
- ▮ Annualized O&M = \$125,000
- ▮ Annual Cost = \$2,343,000

NED BENEFITS

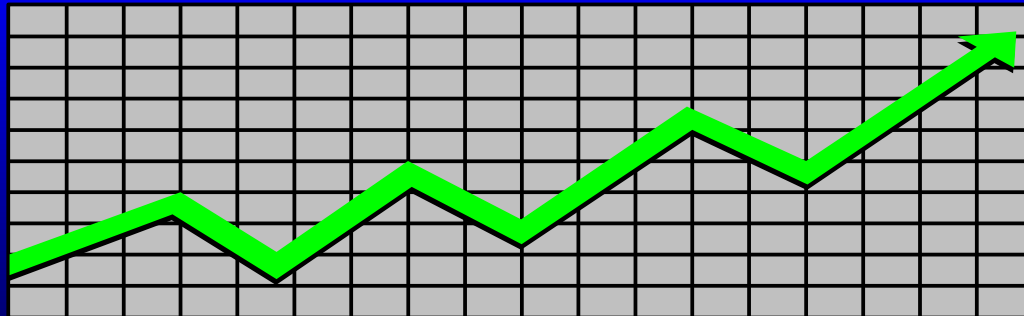


▮ **Contributions to NED account are the direct net benefits that accrue in the study area and the rest of the nation.**

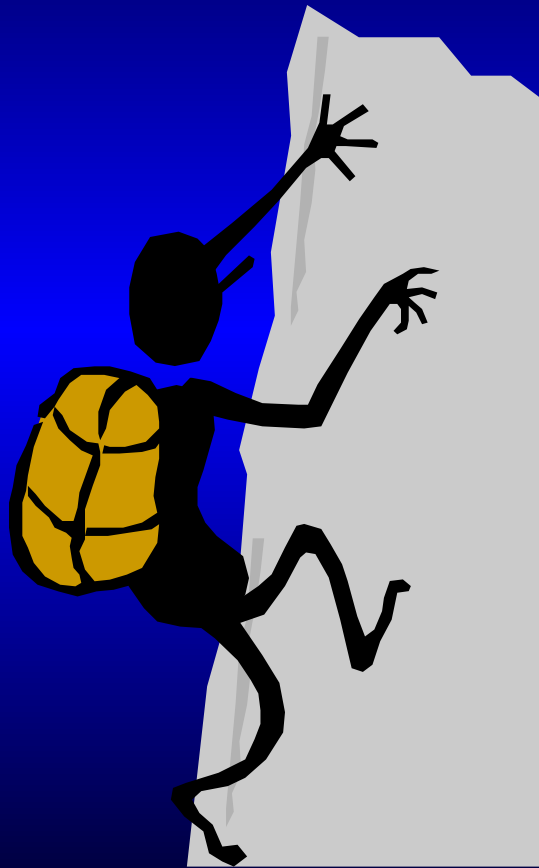
- ▮ **Commercial navigation improvements**
- ▮ **Flood damage reductions**
- ▮ **Hydropower**
- ▮ **Recreation**
- ▮ **Et al**

EVALUATE PLANS ECONOMICALLY

- ▮ **Determine period of evaluation (typ. 50 or 100 years)**
- ▮ **Determine benefits (NED and/or NER) and costs of the project**



NED ANALYSIS PROCESS



- ▮ **Calculate NED benefits and costs at a common point in time - such as the end of the installation period**
- ▮ **Convert this value to an average annual value**
- ▮ **Benefits are quantified for each alternative being evaluated**

NED PLAN

Plan with the greatest net benefits!

**[Net benefits = average annual
benefits -
average annual costs]**

NED Analysis

Annual	Annual		Net	
	Benefits	Costs	BCR	Benefits
PLAN A	\$ 80,000	\$100,000	0.8	(\$20,000)
PLAN B	\$110,500	\$ 85,000	1.3	\$25,500
PLAN C	\$192,000	\$160,000	1.2	
	\$32,000			
PLAN D	\$232,000	\$208,000	1.1	\$24,000

NER BENEFITS – ECOSYSTEM RESTORATION

NER = National Ecosystem Restoration

- ▮ **Non-monetary project benefits or outputs**
- ▮ **Significance of resource must be explained**
- ▮ **Ecosystem outputs must be measurable and quantifiable**

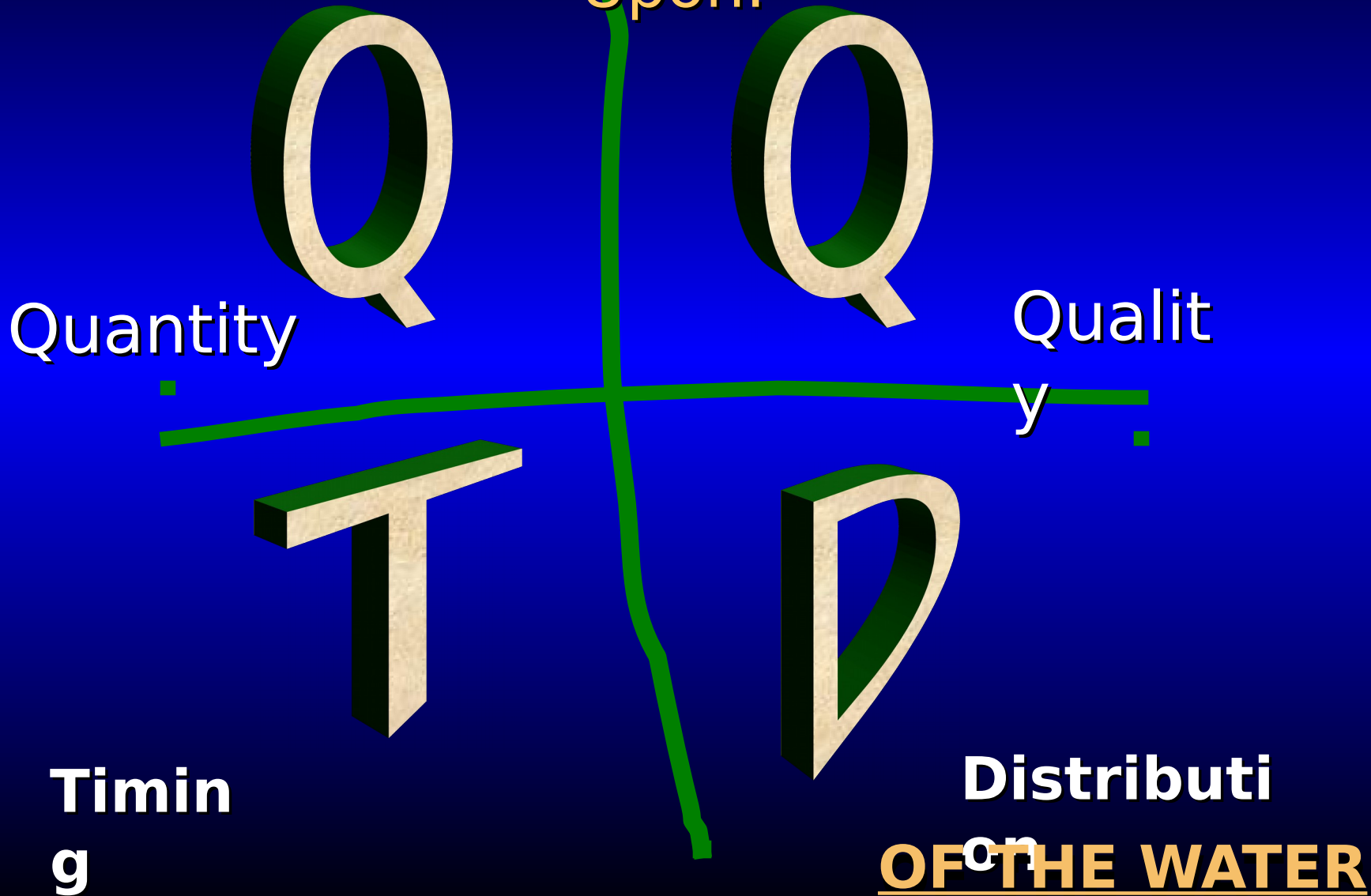
NER EVALUATION PROCESS



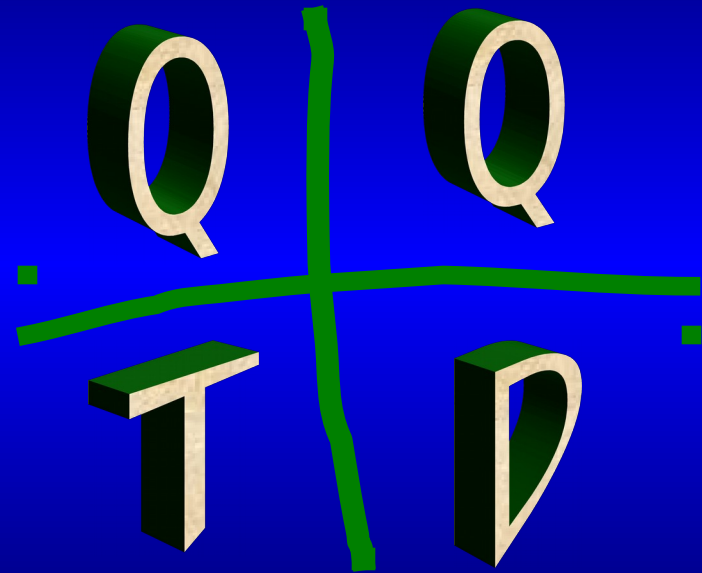
- ▮ **Identify relationship between changes in outputs and changes in costs. Completed through Cost Effectiveness and Incremental Cost Analysis**
- ▮ **No monetary net benefits or Benefit-to-Cost Ratio**

Aquatic Ecosystem Health is Dependent

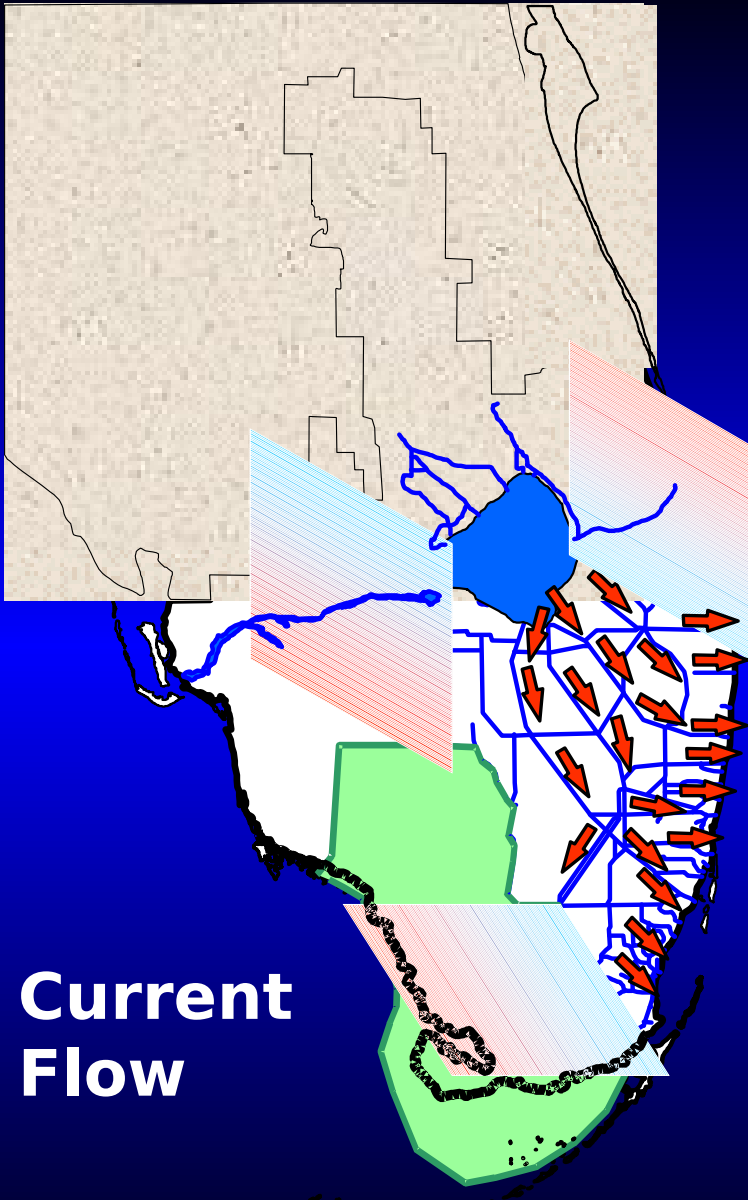
Upon:



An Ecosystem in *Why?* Trouble ...

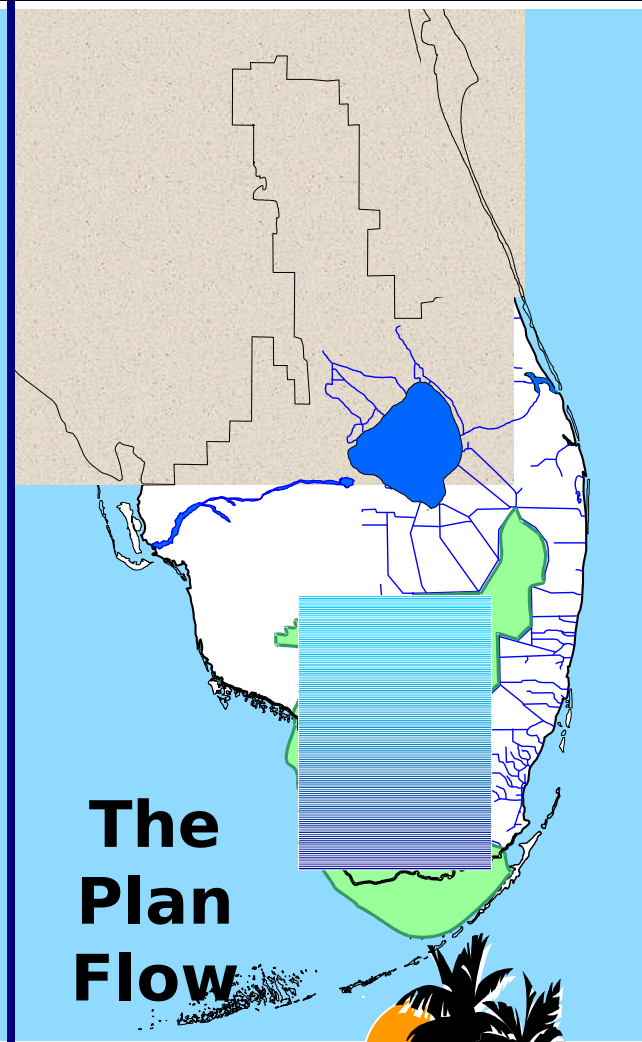
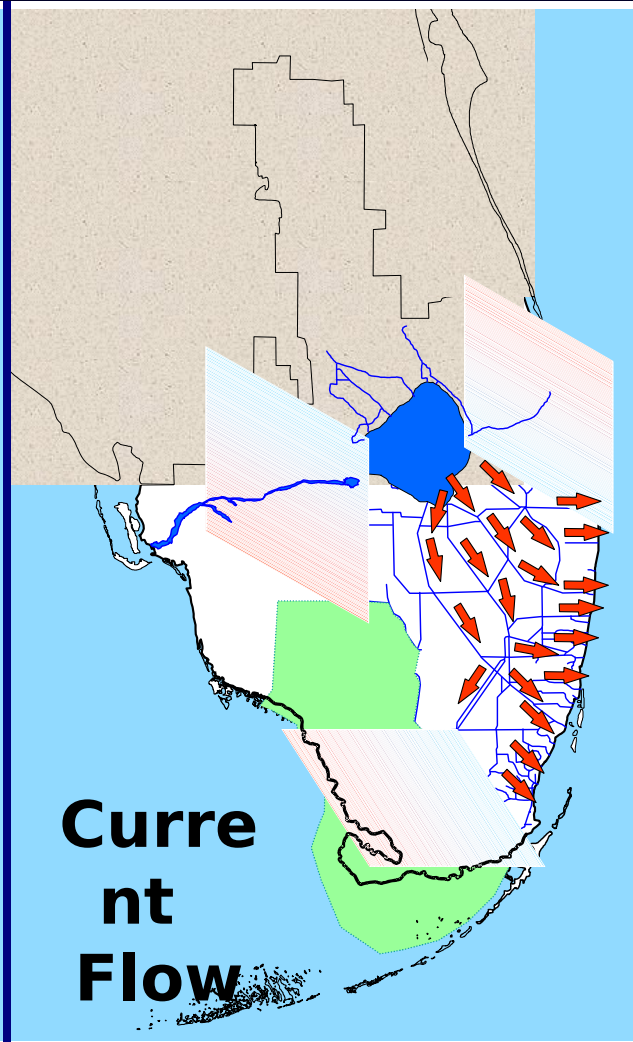
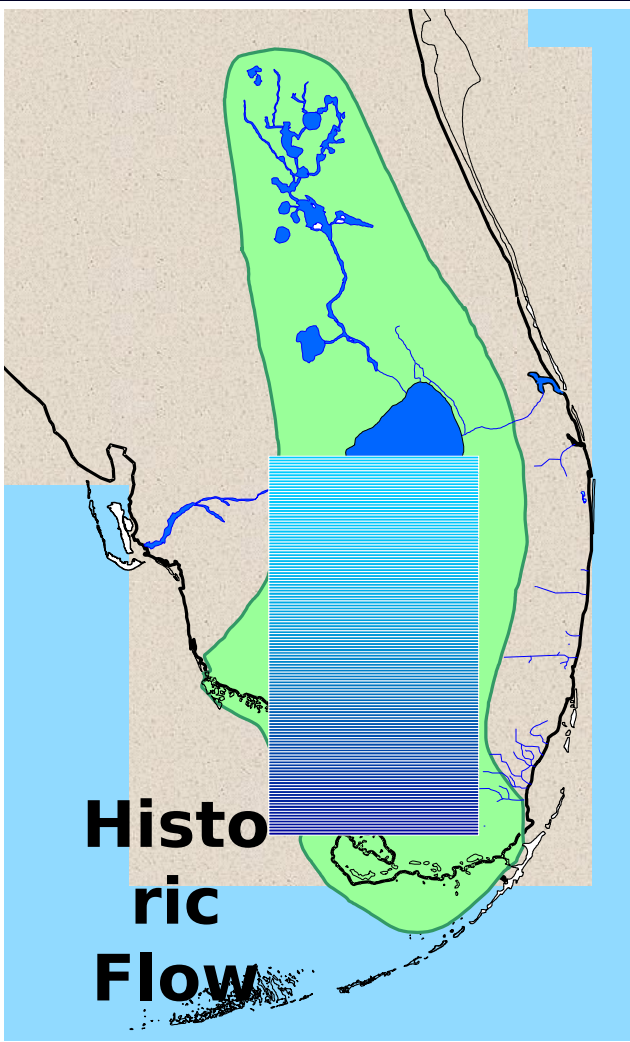


**Current
Flow**



America's Everglades are in Serious Peril

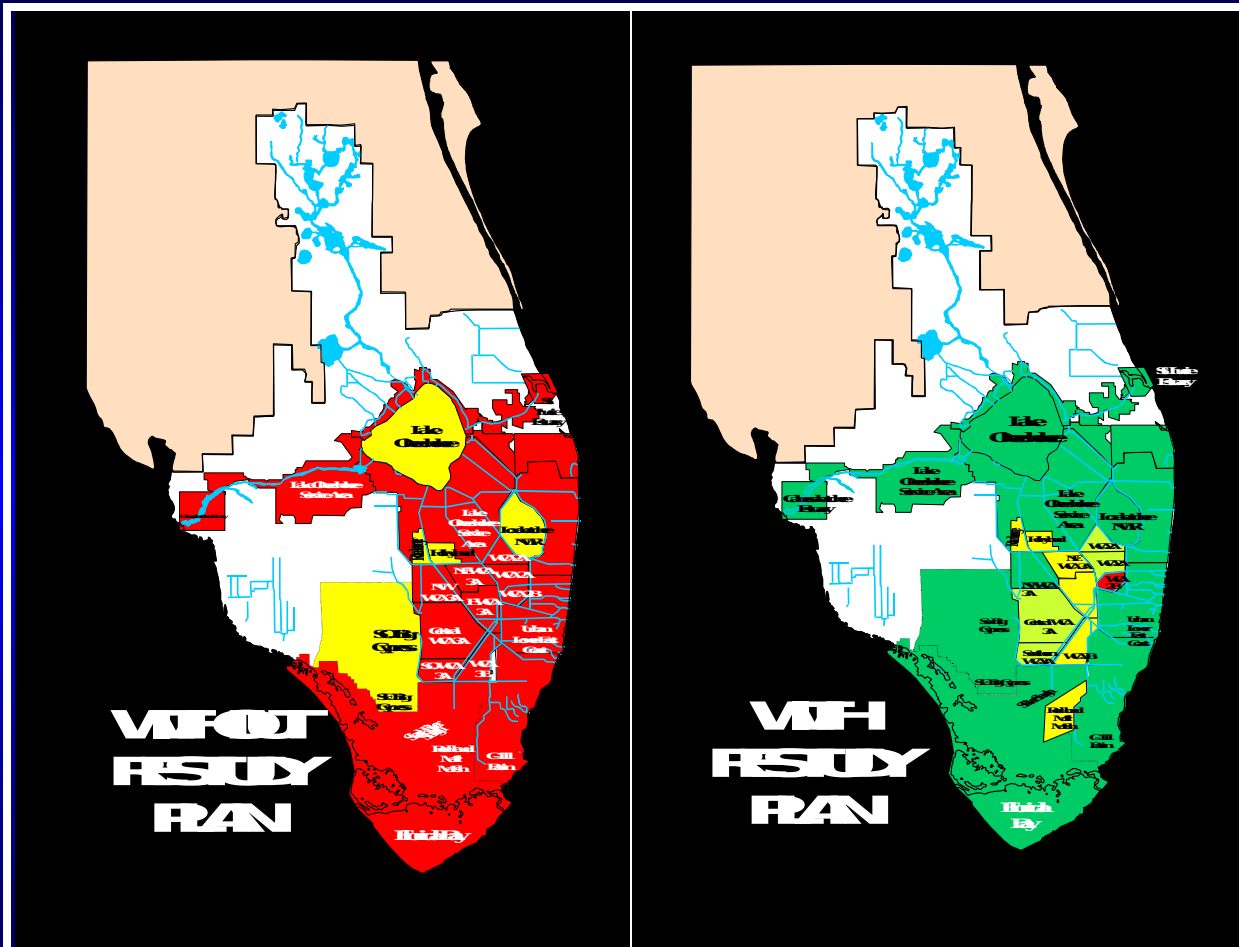




America's Everglades are in Serious Peril



Ecosystem Conditions



- = Successful
- = Marginal
- = Recovery Unlikely



America's Everglades are in Serious Peril

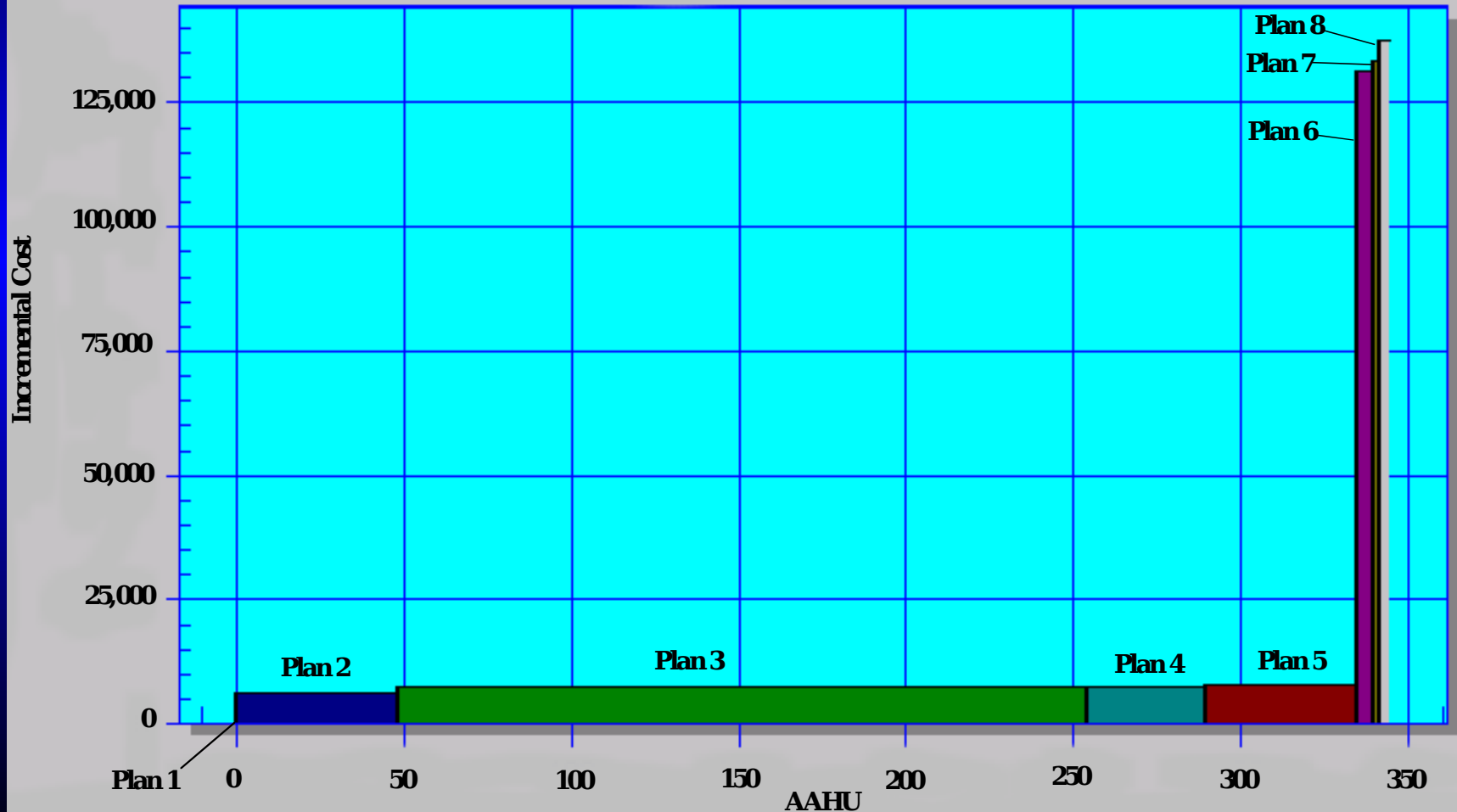
NER Evaluation

- **Cost Effectiveness Analysis and Incremental Cost Analysis (CEA/ICA)**
 - **A Tool to help determine two items**
 - **Most cost-effective alternative plans to reach various levels of restoration**
 - **To evaluate whether different levels of restoration are worth it**

Reference “IWR Plan” software package

Sample Incremental Analysis

"Best Buy" Plans



NER Evaluation Criteria

- **Efficiency**
- **Effectiveness**
- **Acceptability**
- **Completeness**

Reasonableness of cost is the test instead of BCR

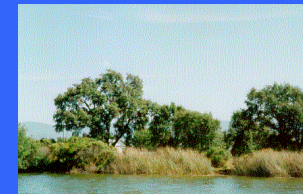
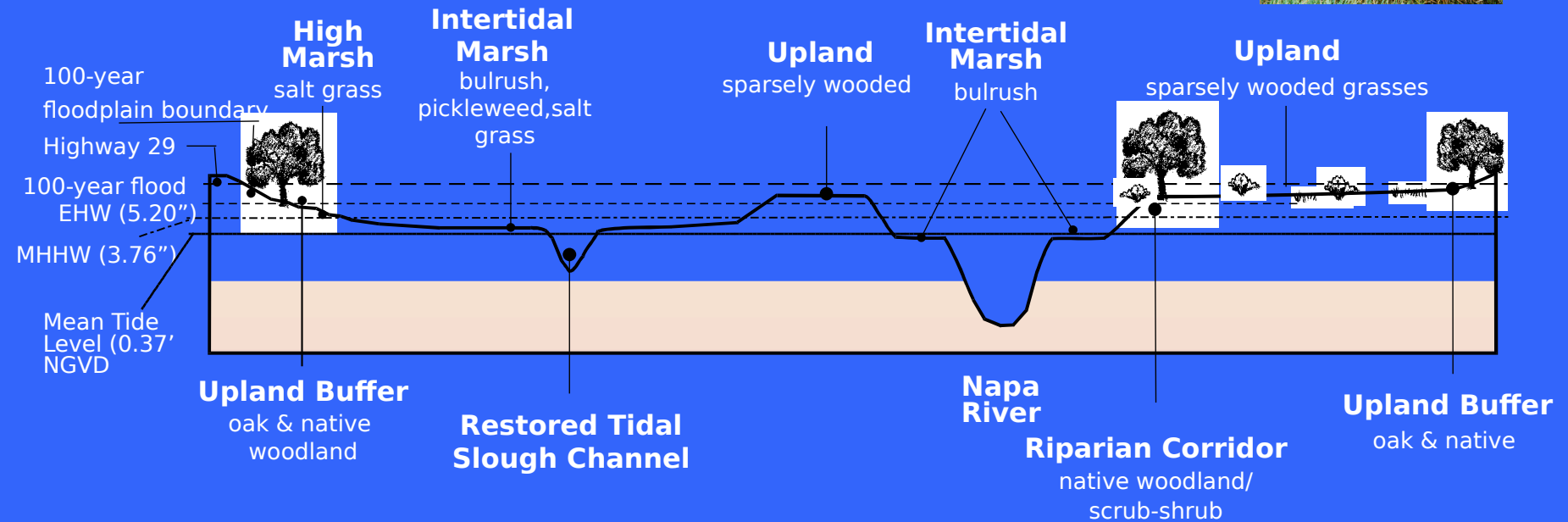
NER Evaluation Criteria

Other considerations to evaluate alternatives:

- Importance of Outputs.**
- Resource Significance.**
 - **Technical**
 - **Scientific**
 - **Cultural**
 - **Legal**

Technical Analysis

Habitat Types on Terraces



Evaluate Plans Environmentally

- ▮ **Determine environmental impacts caused by the alternative plans**
- ▮ **Prepare NEPA (National Environmental Policy Act) documentation [EIS, EA/FONSI] and other environmental compliance requirements**

More to come in Module 15



What is Mitigation ?

Mitigation addresses adverse environmental effects of new project construction and operation and should be planned and implemented concurrently (if not before).

STEP 5: Comparison of Alternative Plans

▮ **There are different methods for comparing alternatives and their effects:**

- ▮ **Monetary evaluation method**
- ▮ **Multi-criteria evaluation method**
- ▮ **Trade-off analysis**
- ▮ **Goal achievement method**
- ▮ **Incremental cost/cost effectiveness analysis**
- ▮ **Non-monetary criteria (i.e. loss of life)**



Table 34: Summary Comparison of Detailed Plans for Duck Creek, Ohio ¹¹

	No Action	NED Plan	Locally Preferred Plan
1. PLAN DESCRIPTION	No Action/Without Project Condition	Reach DC-A 25-year protection; Reach DC-B 600-year protection; & Reach DC-C 100-year protection	Sections DC-A, DC-B, DC-C Uniform 100-year level of protection
2. IMPACT ASSESSMENT			
A. National Economic Development (NED)			
(1) Project Cost	\$0	\$13,805,000	\$14,000,000
(2) Annual Cost	\$0	\$0	\$1,443,000
(3) Total Annual Benefits	\$0	\$0	\$1,783,000
(4) Annual Net Benefits	\$0	\$0	\$0
(5) Benefit to Cost Ratio	N/A Ranks 3rd	N/A Ranks 1st	N/A Ranks 2nd
B. Environmental Quality (EQ)			
(1) Air/Noise	Normal noise levels created by traffic, business, and industrial activities. Ranks 1st	Temporary increased noise levels during 4-year construction period. Ranks 3rd	Temporary increased noise levels during 4-year construction period. Ranks 3rd
(2) Water Quality	Existing water quality for duck creek is good. Contaminant runoff from adjacent industrial areas eliminated for all DC-A, and fully protected for DC-B and DC-C. Ranks 1st	Temporary increased water quality levels during 4-year construction period. Contaminant runoff from adjacent industrial areas eliminated for all DC-A, and fully protected for DC-B and DC-C. Ranks 1st	Temporary increased water quality levels during 4-year construction period. Contamination from flood runoff from adjacent industrial areas eliminated for all reaches. Ranks 1st.
(3) Vegetation	Existing vegetation for streams in Southern Ohio. Excellent habitat for woodlarks, songbirds and urban wildlife. Ranks 2nd	Temporary loss of vegetation during 4-year construction period. Ranks 2nd	Permanent loss of 13 acres to project features; temporary loss of 8 acres during 4-year construction period. Ranks 3rd.
(4) Threatened & Endangered Species	No endangered species	No impact	No impact
(5) Aquatic Birds	Existing biota populations to be maintained. No impact to systems out of project area.	Temporary decreased biota populations during 4-year construction period. Possible increase in biota population with decrease in contaminant runoff from protected industrial areas. Ranks 1st (Tie).	Temporary decreased biota populations during 4-year construction period. Possible increase in biota population with decrease in contaminant runoff from protected industrial areas. Ranks 1st (Tie).
(6) Cultural Resources & Historic Properties	No cultural resources or historic properties in work area.	No impact.	No impact.
C. Regional Economic Development (RED)	Same as National Economic Development (NED) impacts. Ranks 3rd.	Same as National Economic Development (NED) impacts. Ranks 1st	Same as National Economic Development (NED) impacts. Ranks 2nd.
D. Other Social Effects (OSE)			

**See Sample of the Four
P&G Evaluation Accounts!
NED: EQ: RED: OSE:**

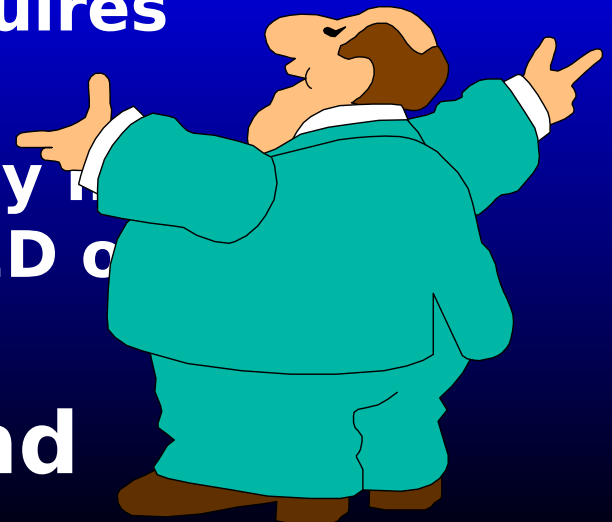
STEP 6: Select Recommended Plan

Cost Effective:

- Current guidance calls for recommending the NED or NER Plan unless there is a locally preferred plan (LPP)
- LPP recommendation requires ASA(CW) concurrence
- Sponsors typically pay any incremental cost above NED or NER Plan

Environmentally sound

Technically feasible



SUMMARY

- ▮ **Planning is a formal process**

- ▮ **Determine “best” plan:**
 - ▮ **Economically justified**
 - ▮ **Environmentally sound**
 - ▮ **Engineeringly feasible**
 - ▮ **Socially & Politically acceptable**

